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BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte LESTER F. LUDWIG

Appeal 2009-008141
Application 10/702,415
Technology Center 2800

Before JOSEPH F. RUGGIERO, JOHN A. JEFFERY, and
MARC S. HOFF, *Administrative Patent Judges.*

JEFFERY, *Administrative Patent Judge.*

DECISION ON APPEAL[1]

Appellant appeals under 35 U.S.C. § 134(a) from the Examiner's rejection of claims 1-50. We have jurisdiction under 35 U.S.C. § 6(b). We reverse.

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[1] The two-month time period for filing an appeal or commencing a civil action, as recited in 37 C.F.R. § 1.304, or for filing a request for rehearing, as recited in 37 C.F.R. § 41.52, begins to run from the "MAIL DATE" (paper delivery mode) or the "NOTIFICATION DATE" (electronic delivery mode) shown on the PTOL-90A cover letter attached to this decision.

STATEMENT OF THE CASE

Appellant's invention enriches timbre of audio signals by adding swelling resonance and/or twang by providing plural audio signal delays, each with high resonance positive feedback, distortion characteristics, and selectable delay times. *See generally* Abstract; Spec. ¶ 0231; Fig. 39. Claim 1 is illustrative:

> 1. A system for enriching timbre of audio signals by adding swelling resonance, twang, or both, said system comprising:
>
> an incoming audio signal; and
>
> a plurality of audio signal delays, wherein each delay of said plurality of audio signal delays receive signal inputs comprising said incoming audio signal and a distinct high resonance positive feedback signal, and includes a distinct selectable delay time corresponding to a period of a desired resonant frequency, wherein each delay of said plurality of audio signal delays combine said received signal inputs resulting in a combined signal, and after said combined signal reaches a predetermined threshold, distortion is introduced into said combined signal, and wherein each delay of said plurality of audio signal delays generates an outgoing signal according to said selectable delay time, and wherein said outgoing signal comprises said combined signal and any distortion that has been introduced.

RELATED APPEALS

This appeal is said to be related to six other appeals in connection with Application Serial Numbers (1) 09/812,400 (Appeal No. 2009-002201); (2) 10/676,926 (Appeal No. 2009-006844); (3) 10/680,591(Appeal No. 2009-008916); (4) 10/702,262 (Appeal No. 2009-009356); (5) 10/703,023 (Appeal No. 2009-010281); and (6) 11/040,163 (Appeal No. 2010-009424).

App. Br. 3; Supp. App. Br. 2; Reply Br. 2.[2] Appellant, however, notes that prosecution was reopened in the '262 application. App. Br. 3; Supp. App. Br. 2.

We previously decided two of these appeals (09/812,400 and 10/676,926). *See Ex parte Ludwig*, No. 2009-002201, 2009 WL 3793386 (BPAI 2009) (non-precedential) (reversing the Examiner's anticipation and obviousness rejections); *see also Ex parte Ludwig*, No. 2009-006844, 2010 WL 4917799 (BPAI 2010) (non-precedential) (same).

CITED REFERENCES

The Examiner relies on the following as evidence of unpatentability:

Gerzon	US 5,555,306	Sept. 10, 1996
Okamura	US 5,652,797	July 29, 1997
Levine	US 5,848,164	Dec. 8, 1998 (filed Apr. 30, 1996)

THE REJECTIONS

1. The Examiner rejected claims 1, 2, 4, 7-9, 11-27, 29, 32-34, and 36-50 under 35 U.S.C. § 103(a) as unpatentable over Levine and Okamura. Ans. 3-5.
2. The Examiner rejected claims 3, 5, 6, 10, 28, 30, 31, and 35 under 35 U.S.C. § 103(a) as unpatentable over Levine, Okamura, and Gerzon. Ans. 6.

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[2] Throughout this opinion, we refer to (1) the Appeal Brief filed August 8, 2008 (supplemented September 8, 2008); (2) the Examiner's Answer mailed October 21, 2008; and (3) the Reply Brief filed December 22, 2008.

THE OBVIOUSNESS REJECTION OVER LEVINE AND OKAMURA

Regarding independent claim 1, the Examiner finds that Levine discloses a system for enriching audio signal timbre with every recited feature except for "providing distortion," but cites Okamura to cure this deficiency in concluding that the claim would have been obvious. Ans. 3-5, 7-9.

Appellant makes three principal arguments, namely that (1) Levine does not teach plural audio signal delays receive (a) the same incoming audio signal, and (b) a high resonance positive feedback signal (App. Br. 11-12; Reply Br. 3-4); (2) Levine does not teach that each delay has a distinct selectable delay time, let alone a selectable delay time corresponding to a period of a desired resonant frequency (App. Br. 13-14; Reply Br. 6-8); and (3) Okamura fails to introduce distortion into the combined signal after the combined signal reaches a predetermined threshold (App. Br. 14; Reply Br. 8-9) as claimed. The issues before us, then, are as follows:

ISSUES

Under § 103, has the Examiner erred in rejecting claim 1 by finding that Levine and Okamura collectively would have taught or suggested:

(1) plural audio signal delays receive signal inputs comprising (a) the same incoming audio signal, and (b) a high resonance positive feedback signal;

(2) each delay includes a distinct selectable delay time corresponding to a period of a desired resonant frequency; and

(3) introducing distortion into the combined signal after the combined signal reaches a predetermined threshold?

FINDINGS OF FACT (FF)

1. Levine's system 100 processes audio data on a subband-by-subband basis to produce audio effects equivalent to those produced by post-processing a decompressed fullband audio signal. Levine, Abstract; col. 1, ll. 4-10; col. 3, ll. 17-21; Fig. 1.

2. Levine's system includes an analysis filter bank 138 that processes in real time a fullband fullrate audio signal received from a real-time audio source or disk files 140. The analysis filter bank (1) compresses; (2) encodes; and (3) splits the fullband fullrate audio signal into 32 equally-spaced subbands (116-1 to 116-32) of "critically sampled compressed audio data" 116, such that the total amount of subband data equals the amount of data before its division into subband data. Levine, col. 3, ll. 35-58; col. 4, ll. 42-53; Figs. 1-2.

3. Each subband carries critically-sampled data for a distinct frequency range, with the 32 subbands covering the frequency range from 0 to 22.05 kHz (i.e., each subband carries data for a frequency range of about 689 Hz). Levine, col. 3, ll. 44-49; Figs. 1-2.

4. One or more customized subband effects filters (128-1 to 128-32) can be applied to one or more subbands (116-1 to 116-32). The effects filters are customized by (1) using selected stored prototype subband effects filters 118 as a base template, and (2) executing a subband filter customization procedure 132 to adjust associated parameters to produce the desired effect. Levine, col. 3, l. 59 – col. 4, l. 13; col. 4, ll. 54-56; Figs. 1-6C.

5. The set of stored prototype subband effects filters produce the following effects: (1) echo 120 via echo filter 300 (Fig. 3); (2) flanging via flange filter 400 (Fig. 4); (3) chorus 124 via chorus effect filter 500 (Fig. 5); and (4) reverberation 126 via reverberation effect filter 600 (Figs. 6A-C). Levine, col. 2, l. 66 – col. 3, l. 6; col. 3, ll. 59-65; Figs. 3-6C.

6. Customizable parameters for each selected prototype subband effects filter include (1) a delay line length 301, 401, 501-1 to 501-3, 601-1 to 601-2; (2) one or more feedback scalars 302, 402; and (3) one or more feedforward scalars 403, 502, 602. To create a customized subband flange effect audio filter, for example, the sound system designer can adjust (1) feedfoward gain scalar 403; (2) feedback gain scalar 402; and (3) delay length 401. Levine, col. 4, ll. 13-25; Figs. 3-6C.

7. One or more customized subband effects filters can be grouped together to form a user-defined group of such filters to process the entire range of compressed audio subband data. Levine, col. 4, ll. 27-31.

8. Levine notes an example where if an echo effect having a delay line length of 300 msec is desired, a subband filter with the design shown in Figure 3 can be placed on each subband, where the customized echo effect filter has the same feedback scalars and a 9.4 msec delay line length. Levine, col. 5, ll. 44-50; Figs. 2-3.

9. Each of the 32 subbands can be processed separately and independently, including placing different customized subband effects filters on different frequency regions. For example, the user can process certain frequencies for an input bass signal, yet not alter its lowest frequencies (e.g., the fundamental and first few harmonics). Levine, col. 6, l. 59 – col. 7, l. 18; Fig. 2.

10. Okamura's system imparts a variety of sound effects to musical tones. In Figure 24, the distortion-with-equalizer effect ("DIST + EQ") is selected for sound effect "EF3." Okamura, Abstract; col. 22, ll. 29-34; Fig. 24.

ANALYSIS

Based on the record before us, we find error in the Examiner's obviousness rejection of independent claim 1. First, claim 1 requires each audio signal delay to recite receive *signal inputs* comprising (a) the same incoming audio signal (i.e., "*said* incoming audio signal"), and (b) a high resonance positive feedback signal. Despite Appellant's arguments to the contrary (App. Br. 11-12; Reply Br. 3-4), based on the scope and breadth of the claim language, we see no error in the Examiner's position (Ans. 7) that each delay-based customized effects filter in Levine would receive a signal input comprising the same incoming audio signal 140—at least in part. *See* FF 2-4. Although Levine's analysis filter bank splits the incoming audio signal into 32 equally-spaced subbands (FF 2-3), nothing in claim 1 precludes each delay-based customized effects filter receiving a *component* (i.e., subband) of the incoming audio signal 140—even if compressed and encoded. While these signal components have a limited bandwidth, they nonetheless constitute signal inputs comprising part of incoming audio signal—albeit compressed and encoded. *See* FF 2-3. And nothing in the claim precludes the Examiner's reliance on the feedback gain scalar 402 in Levine's flange filter of Figure 4 for least suggesting the recited high resonance positive feedback signal, particularly since (1) the flange filter includes an adjustable delay element (FF 6), and (2) Levine at least suggests

placing similar such filters (and their associated adjustable delays) on every subband. *See* FF 4-9. That these delay times are independently adjustable means that they would be distinct for each subband. *See id.* While Levine cites a particular example where every subband has the same feedback and delay settings as Appellant indicates (App. Br. 14; FF 8), Levine nevertheless provides distinct, independently-adjustable filters (with adjustable delay times) for each subband (FF 9).

We also see no error in the Examiner's position (Ans. 8) that these adjustable delay times would at least correspond to a period of a desired resonant frequency as claimed. The term "resonance" is defined, in pertinent part, as "[t]he condition existing in a body when the frequency of an applied body equals the natural frequency of the body."[3] Given this definition, we see no reason why the various adjustable delay times would not at least suggest a correspondence to a period of a desired resonant frequency as claimed, particularly since Levine teaches processing certain harmonic frequencies of an input musical instrument (bass) signal, yet leaving other frequencies unprocessed to achieve the desired sound enhancement effect. FF 9.

But we agree with Appellant (App. Br. 14; Reply Br. 8-9) that Okamura does not teach nor suggest introducing distortion into the combined signal *after the combined signal reaches a predetermined threshold* as claimed. Nor has the Examiner shown that the combined Levine/Okamura system would even be capable of this conditional distortion inclusion. Although Okamura imparts a distortion-with-equalizer effect to a

[3] Neil Sclater & John Markus, *McGraw-Hill Electronics Dictionary*, 6th ed. (1997), at 303.

combined signal in connection with a selected sound effect (FF 10), that hardly means that this distortion would be introduced *after the combined signal reaches a predetermined threshold*—a crucial qualifier in claim 1. The Examiner's position that this threshold "would be the point that the combined signal changes based on the added effect" (Ans. 9) is unavailing. Not only does the Examiner fail to indicate how this "threshold" is predetermined, such a "threshold" would already include the distortion added to combined signal. But claim 1 requires that the distortion not be added until *after* the combined signal—without the distortion—reaches a predetermined threshold. This feature is simply not taught or suggested by the cited prior art.

We are therefore persuaded that the Examiner erred in rejecting (1) independent claim 1; (2) independent claim 26 which recites commensurate limitations; and (3) dependent claims 2, 4, 7-9, 11-25, 27, 29, 32-34, and 36-50 for similar reasons.

THE OBVIOUSNESS REJECTION OVER LEVINE, OKAMURA, AND GERZON

Since the Examiner has not shown that the cited prior art cures the deficiencies noted above regarding the independent claims, we will not sustain the obviousness rejection of dependent claims 3, 5, 6, 10, 28, 30, 31, and 35 (Ans. 6) for similar reasons.

CONCLUSION

The Examiner erred in rejecting claims 1-50 under § 103.

ORDER

The Examiner's decision rejecting claims 1-50 is reversed.

REVERSED

pgc

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